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EXAMINER	
MOE, AUNG SOE	

ART UNIT	PAPER NUMBER
2612	6

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/074,179	LIN, QIAN	
	Examiner	Art Unit	
	Aung S. Moe	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *03 May 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-19,21-24 and 26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *6-13* is/are allowed.

6)☒ Claim(s) *3-5, 14-19, 21-24 and 26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed May 03, 2004 have been fully considered but they are not persuasive.

Regarding claims 3-5, the applicant alleged (page 12 of the remarks) that Desormeaux '821 described a captured image is subdivided into an array of paxels; each paxel is defined as a block. Desormeaux '821 fails to teach generating a line pixel profile of a captured image as claimed.

In response, the Examiner respectfully disagrees because Desormeaux '821 does in fact generate a line pixel profile of a captured image as claimed. For example, it is cleared form Figures 24 and 27 that the pattern portion 170 of the subdivided image 168 is a clear example of "a line pixel profile of a captured image". Since each "paxel" is made of a block of pixels, the pattern portion 170 comprises a pixel to form "a line pixel profile" as claimed. In fact, the claimed invention is not limited to how a line pixel profile is generated by using a specific pixel arrangement, thus, the divided pattern profile 170/152 having a line of pixel profile as shown in Figs. 24 and 27 does in fact read on the broadly claimed limitations such that "a line pixel profile" as claimed because such divided pattern area 170/152 are generated by using a line of pixel of the captured image.

Furthermore, the applicant admitted in page 12 of the remarks that "Desormeaux '821 (col. 15, lines 5-15 and col. 31, lines 15+) is relied upon for disclosing computing an absolute difference in a channel gray level between adjacent pixels in the horizontal direction using the line pixel profile."

Moreover, the applicant stated "Desormeaux '821 performs paxel (as opposed to pixel) analysis. In response, the examiner disagrees because Desormeaux '821 clearly discloses in col. 31, lines 15+ that the analysis is in fact performed for each pixel of the difference image, thus, Desormeaux '821 performs pixel analysis.

Regarding claims 14-19, the Applicant alleged that "**in the Specification**, the method of Applicant's invention computes brightness, noise level contrast and presence or absence of red eye in determining the face quality using segments associated with skin color", "Luo fails to disclose computation of brightness, noise level and contrast as well as the use of segments associated with skin color."

In response to Applicant's argument that Desormeaux '821 does not include certain features of Applicant's invention, the limitations on which the Applicant relies (i.e., computes brightness, noise level contrast and presence or absence of red eye in determining the face quality using segments associated with skin color) are not stated in the claims. It is the claims that define the claimed invention, and it is claims, not the specifications, that are anticipated.

As for claims 21-23, the Applicant alleged that Desormeaux '821 does not teach of "binary mapping of a captured image containing only black and white pixels". In response, the Examiner respectfully disagrees because the digitally divided mapping of the captured image as shown in Figs. 2 and 24 provide "binary mapping of the captured image" as claimed (i.e., see col. 25, lines 5-35), and the dark pixel and the bright pixel from the digitally divided grid as shown in Figs. 24 provide "black and white pixels" as claimed. It is also noted from Figs. 24 that the bright pixel from the digitally divided grid as shown in Fig. 24; such as the sun in the

scene can cause bright pixels, thus, the sun in the captured scene could represent saturated pixels); and subdividing said binary mapping into a plurality of regions (i.e., see Figs. 1 and 24).

In view of the above, claims 21-23 are anticipated by Desormeaux '821 for at least the reasons as discussed above.

As for claims 24 and 26, the Applicant alleged that the combination of Desormeaux '821 and Luo fails to disclose a face quality measure in the manner described for the same reasons as discussed in claim 14. In response, the Examiner has previously indicated for the claim 14 above that the features relied by the Applicant is not clearly recited in the present claimed invention as claimed, thus, the Examiner will maintain the rejections as follows:

Claim Objections

2. Claim 16 is objected to because of the following informalities: In claim 16, line 1, please change "figure of merit." too - - figure of merit; - -. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 3 and 21-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Molloy Desormeaux (U.S. 6,577,821).

Regarding claim 3, Desormeaux '821 discloses a method for assessing the photo quality of a captured image in a digital camera (i.e., Fig. 4; col. 7, lines 5+), said method comprising:

checking, in-camera, the photo quality of the captured image to determined if the photo quality is acceptable; and providing a corresponding photo quality feedback to a camera user (i.e., Figs. 32-37, 44-45, 47; col. 27, lines 50+, col. 28, lines 55+, and col. 29, lines 55+),

computing a photo sharpness figure of merit for the captured image (Fig. 34; the figure 242/240); and comparing said computed photo sharpness figure of merit to a threshold to determine if said photo sharpness figure of merit exceeds said threshold (i.e., col. 14, lines 40+, col. 15, lines 5+, col. 26, lines 50+, col. 28, lines 5+, col. 29, lines 65+), the computing step further comprising:

generating a line pixel profile of the captured image (i.e., see Figs. 2, 24, and 27); computing an absolute different in a channel gray level between adjacent pixels in the horizontal direction using said line pixel profile (i.e., noted gray level is stored in the memory 54 and it's used during the quality computing processing to determine an absolute difference values; see col. 15, lines 5-15, col. 31, lines 15+); and picking the maximum absolute difference as the photo sharpness figure of merit (i.e., col. 14, lines 44+; col. 31, lines 20+).

Regarding claim 21, Desormeaux '821 discloses a method for assessing the photo quality of a captured image in a digital camera (i.e., Fig. 4; col. 7, lines 5+), said method comprising:

checking, in-camera, the photo quality of the captured image to determined if the photo quality is acceptable; and providing a corresponding photo quality feedback to a camera user (i.e., Figs. 32-37, 44-45, 47; col. 27, lines 50+, col. 28, lines 55+, and col. 29, lines 55+),

said checking step further comprising: computing a flare (i.e., Under/Over Exposure control) figure of merit for the captured image (i.e., col. 24, lines 49+, col. 25, line 64 - 26, lines 1+); comparing said computed flare figure of merit to a threshold to determine if said flare figure of merit exceeds said threshold (i.e., col. 28, lines 5+, col. 31, lines 5+, col. 35, lines 40+); and providing a corresponding flare feedback to said camera user (i.e., see Figs. 32-37), wherein the computing step compries:

generating a binary mapping of the captured image (i.e., noted the digitally divided mapping of the captured image as shown in Figs. 2 and 24) containing only black (i.e., the dark pixel from the digitally divided grid as shown in Fig. 24) and white (i.e., the bright pixel from the digitally divided grid as shown in Fig. 24; such as the sun in the scene can cause bright pixels) pixels, said white pixels representing saturated pixels of the captured image (i.e., noted from Fig. 24 that the sun in the captured scene could represent saturated pixels); and subdividing said binary mapping into a plurality of regions (i.e., see Figs. 1 and 24).

Regarding claim 22, Desormeaux '821 discloses comprising: computing a percentage of white pixels in each region to obtain a flare figure of merit; and determining if flare figure of merit in at least one region exceeds a flare threshold (i.e., col. 15, lines 15+; col. 35, lines 45 – col. 36, lines 30+).

Regarding claim 23, Desormeaux '821 discloses wherein said flare threshold is at least 50% (i.e., col. 15, lines 5+, col. 30, lines 20+, col. 31+).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Desormeaux '821 in view of Tretter (U.S. 6,463,173).

Regarding claims 4 and 5, Desormeaux '821 does not explicitly show that the step of transforming RGB color space into YCrCb color space or L*a*b* color space as recited in present claimed invention.

However, the above-mentioned claimed limitations are well known in the art as evidenced by Tretter '173. In particular, Tretter '173 teaches that it is conventionally well known in the art to transform the RGB color space into YCrCb color space or L*a*b* color space as claimed (i.e., col. 7, lines 1-25+).

In view of the above it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Desormeaux '821 as taught by Tretter '173, since Tretter '173 states at col. 3, lines 45+ that such a modification would produce contrast enhanced digital images thereof.

7. Claims 14, 24 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Desormeaux '821 in view of Luo (U.S. 6,134,339).

Regarding claim 14, Desormeaux '821 discloses a method for assessing the photo quality of a captured image in a digital camera (i.e., Fig. 4; col. 7, lines 5+), said method comprising:

checking, in-camera, the photo quality of the captured image to determined if the photo quality is acceptable; and providing a corresponding photo quality feedback to a camera user (i.e., Figs. 32-37, 44-45, 47; col. 27, lines 50+, col. 28, lines 55+, and col. 29, lines 55+).

Furthermore, it is noted that although Desormeaux '821 suggested the quality of the digital image can be analyzed to determine eye positions within the image (i.e., see col. 18, lines 10+) so that the quality of part of the captured image (i.e., the Face of the image 148 as shown in Fig. 14B and 24) may be determined by comparing with the threshold if the quality figure of merit exceeds the threshold (i.e., col. 31, lines 5+, col. 35, lines 50+ and col. 36, lines 5+), Desormeaux '821 does not explicitly state "a face quality" computing as claimed.

However, computing, in a camera, a face quality figure of merit for the captured image by comparing the computed face quality figure of merit to a threshold to determine if the face quality figure of merit exceeds the threshold is well known in the art as taught by Luo '339 (i.e., see Figs. 4 and 5; col. 2, lines 15+, col. 7, lines 15+, col. 8, lines 40+, col. 11, lines 5+).

In view of the above, having the system of Desormeaux '821 and then given the well-established teaching of Luo '339, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Desormeaux '821 as taught by Luo '339, since Luo '339 states at col. 4, lines 15+ that such a modification would enable

enhancement and manipulation of images containing one or more human faces, so that, red-eye correction can be reliably performed.

Regarding claim 24, it is noted that Desormeaux '821 discloses a method for assessing the photo quality of a captured image in a digital camera as discussed in claims 3 and 21-23 (i.e., see above rejection above). Further, it is noted that although Desormeaux '821 suggested the quality of the digital image can be analyzed to determine eye positions within the image (i.e., see col. 18, lines 10+) so that the quality of part of the captured image (i.e., the Face of the image 148 as shown in Fig. 14B and 24) may be determined by comparing with the threshold if the quality figure of merit exceeds the threshold (i.e., col. 31, lines 5+, col. 35, lines 50+ and col. 36, lines 5+) and providing the corresponding part of image quality may be feed-backed to the user as shown in Figs. 33-37, Desormeaux '821 does not explicitly state that the "a face quality" computing step for determining the face quality figure of merit for the captured image as claimed.

However, the above-mentioned claimed limitations are well-known in the art as evidenced by Luo '339. In particular, Luo '339 teaches the step of computing, in a camera, a face quality figure of merit for the captured image by comparing the computed face quality figure of merit to a threshold to determine if the face quality figure of merit exceeds the threshold (i.e., see Figs. 4 and 5; col. 2, lines 15+, col. 7, lines 15+, col. 8, lines 1+, col. 11, lines 5+), and outputting the appropriate error code if the face quality of merit does not satisfy, thus, the eye-defect correction may be performed automatically in the digital camera (40) (see col. 8, lines 5+).

In view of the above, having the system of Desormeaux '821 and then given the well-established teaching of Luo '339, it would have been obvious to one having ordinary skill in the

art at the time the invention was made to modify the system of Desormeaux '821 as taught by Luo '339, since Luo '339 states at col. 4, lines 15+ that such a modification would enable enhancement and manipulation of images containing one or more human faces, so that, the eye-defect correction may be reliably performed automatically in the digital camera (i.e., see col. 8, lines 30+).

Regarding claim 26, Desormeaux '821 discloses a system for assessing the photo quality of a captured image in a digital camera, said system comprising: an image capture unit (Figs. 1 4 and 24, the element 10); an image processor operative coupled to said image capture unit for processing the captured image (i.e., Fig. 4, the element 80); a photo quality check unit operative coupled to said image processor for checking, in camera, the photo quality of the processed image (i.e., Fig. 4, 32-37; col. 27, lines 50+); and a display (26) operatively coupled to said photo quality check unit for providing a corresponding photo quality feedback to a camera user (i.e., see Figs. 32-37).

Moreover, it is noted that Desormeaux '821 discloses the system as discussed above and further comprises: a photo sharpness/flare (i.e., the exposure and blur; see col. 27, lines 55+, col. 29, lines 5+) check module operative coupled between said image processor (Figs. 4, 25, and 50; the elements 80, 106, 81 and 54) and the display (26) for checking in-camera the photo sharpness/flare of processed image as shown in Figs. 33-37.

Further, it is noted that although Desormeaux '821 suggested the quality of the digital image can be analyzed to determine eye positions within the image (i.e., see col. 18, lines 10+) so that the quality of part of the captured image (i.e., the Face of the image 148 as shown in Fig. 14B and 24) may be checked (i.e., col. 31, lines 5+, col. 35, lines 50+ and col. 36, lines 5+) by

providing the corresponding part of image quality on the display (26) to the user as shown in Figs. 33-37, Desormeaux '821 does not explicitly state that the "a face quality check module operatively coupled between the image processor, and checking, in-camera, the face quality of the processed image as claimed.

However, the above-mentioned claimed limitations are well known in the art as evidenced by Luo '339. In particular, Luo '339 teaches the use of a face quality check module operatively coupled between the image processor (Fig. 4, the elements 46/44), and checking, in-camera, the face quality of the processed image (i.e., see Figs. 4 and 5; col. 2, lines 15+, col. 7, lines 15+, col. 8, lines 1+, col. 11, lines 5+), and outputting the appropriate error code if the face quality of merit does not satisfy, thereby the eye-defect correction may be performed automatically in the digital camera (40) (see col. 8, lines 5+).

In view of the above, having the system of Desormeaux '821 and then given the well-established teaching of Luo '339, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Desormeaux '821 as taught by Luo '339, since Luo '339 states at col. 4, lines 15+ that such a modification would enable enhancement and manipulation of images containing one or more human faces, so that, the eye-defect correction may be reliably performed automatically in the digital camera (i.e., see col. 8, lines 30+).

8. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Desormeaux '821 in view of Luo '339 as applied to claims as discussed above, and further in view of Lin et al. (U.S. 6,016,354).

Regarding claim 19, although the combination of Desormeaux '821 and Luo '339 shows the step of detecting facial image data from the captured image (i.e., see col. 2, lines 15+ and col. 15+), the combination of Desormeaux '821 and Luo '339 does not explicitly show the steps of converting the detected facial image data into a binary mask of only white and black pixels, wherein the white pixels represent pixels of red color and the black pixels represent pixels of colors other than red; and checking the binary mask for presence of white pixels as claimed.

However, the above-mentioned claimed limitations are well known in the art as evidenced by Lin '354. In particular, Lin '354 teaches the steps of converting the detected facial image data into a binary mask of only white and black pixels, wherein the white pixels represent pixels of red color and the black pixels represent pixels of colors other than red; and checking the binary mask for presence of white pixels (col. 3, lines 15+, col. 5, lines 5+ and col. 6, lines 1+) as claimed.

In view of the above, having the system of Desormeaux '821 and then given the well-established teaching of Lin '354, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Desormeaux '821 as taught by Lin '354, since Lin '354 states at col. 2, lines 10+ that such a modification would automatically reduce redeye in an image with minimal user intervention.

9. Claims 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Desormeaux '821 in view of Luo '339 as applied to claims as discussed above, and further in view of Cheatle (U.S. 2002/0191861).

Regarding claim 15, the combination of Desormeaux '821 and Luo '339 discloses the step of detecting facial image data form the captured image (i.e., see Fig. 4/7; col. 2, lines 15+ of Luo '339). Further, the combination of Desormeaux '821 and Luo '339 does not explicitly show the step of converting the detected image data from RGB color space into L*a*b* color space as claimed.

However, the above-mentioned claimed limitations are well known in the art as evidenced by Cheatle '861. In particular, Cheatle '861 teaches the step of converting the detected image data from RGB color space into L*a*b* color space as claimed (Fig. 1, page 5, the paragraphs 0086-0089).

In view of the above, having the system of Desormeaux '821 and then given the well-established teaching of Cheatle '861, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Desormeaux '821 as taught by Cheatle '861, since Cheatle '861 states at page 2, the paragraph 0011 that such a modification would provide a more convenient method for capturing and cropping electronic images thereof.

Regarding claim 16, the combination of Desormeaux '821, Luo '339 and Cheatle '861 discloses the step of computing the means of L* (i.e., the Luminance signals of the image) to obtain a brightness figure of merit (i.e., see col. 18, lines 1+ of Desormeaux '821; and page 5, paragraphs 0086+ of Cheatle '861); determining if the brightness figure of merit falls within a brightness threshold range (i.e., col. 31, lines 1-35 of Desormeaux '821).

Regarding claim 17, the combination of Desormeaux '821, Luo '339 and Cheatle '861 discloses the step of computing the local standard deviation of L* to obtain a noise (i.e., see Fig. 24 of Desormeaux '821; and page 5, paragraph 0086 of Cheatle '861) figure of merit; and determining if said noise figure of merit exceeds a noise threshold (i.e., col. 31, lines 5+ of Desormeaux '821).

Regarding claim 18, the combination of Desormeaux '821, Luo '339 and Cheatle '861 discloses the step of computing the overall standard deviation of L* (i.e., the average luminance values of the image; see col. 14, lines 40+, col. 31, lines 1+ of Desormeaux '821; and page 5, paragraph 0086 of Cheatle '861) to obtain a contrast figure of merit; and determining if said contrast (i.e., Brightness) figure of merit falls within a contrast threshold range (i.e., col. 31, lines 1-35 of Desormeaux '821).

Allowable Subject Matter

10. Claims 6-8, 9-11 and 12-13 are allowable over the prior art of record.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aung S. Moe whose telephone number is 703-306-3021. The examiner can normally be reached on Mon-Fri (9-5).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy Garber can be reached on 703-305-4929. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Aung S. Moe
Primary Examiner
Art Unit 2612

A. Moe
July 8, 2004